

indebted to Sir John Eliot for his work, "Handbook of Cyclonic Storms in the Bay of Bengal," which has in all human probability been the means of saving many vessels and valuable property—possibly from destruction and certainly from damage—by enabling such vessels, by the rules laid down in that work, to avoid the more dangerous parts of these cyclones, and also generally to escape from them altogether by the knowledge thus given of the indications of the approach of such storms and of the tracks usually followed by them in the different months of the year.

Indeed, it would be an easy matter to prove that in many instances the information and warnings conveyed from the Indian Meteorological Department have been the means of helping that Government and individuals in a most remarkable manner, and that even to put the matter on the lowest ground, it has saved the State vast sums of money by giving accurate information of the precise meteorological conditions of the country, and timely warnings of possible famines, and in some cases, when famine seemed looming in the immediate future, of timely information of approaching rainfall, which at once would do away with the necessity of starting famine relief operations on a large scale. The Indian Meteorological Department has far more than justified its existence, for it has really proved itself of far greater value than its relatively small cost.

Sir John Eliot was also very greatly interested in the subject of solar physics, and he was largely instrumental in starting the solar physics observatory at Kodaikanal, in southern India, and immediately on his retirement he was appointed as a member of the Solar Physics Committee, and also on other scientific bodies, and he worked quite as hard as he had always done in India. Indeed, he was at work up to the last, for on the Monday before his death he was engaged on his new book, "A Handbook of Indian Meteorology," and said he was making great progress with it.

One who knows well the work of Sir John Eliot after his return to Europe writes as follows:—

"Sir John Eliot left India full of enthusiasm for the future of his department. As a public servant he had the rare satisfaction of knowing that a scientific enterprise begun with some doubt and misgiving, had, under his direction, established its claim to a recognised position, and had justified the anticipations of its promoters. His last official step was to secure for his successor the increase of the scientific staff of which he had himself felt the need.

"On his return to England he gave expression to his experience and his aspirations in an address to the British Association at Cambridge in 1904 as president of the subsection for astronomy and cosmical physics. Reviewing his own work and stimulated by his success, he looked beyond the forecasts of to-morrow's weather to anticipating, on strictly scientific grounds, the character of the seasons by the correlation of meteorological phenomena over extended regions of the earth and their possible relation with solar changes. He became secretary of the Solar Commission, originated upon the proposition of Sir Norman Lockyer by the International Meteorological Committee, which met at Southport in 1903. The purpose of the committee was to collect comparable meteorological data from all parts of the world and solar data for comparison with them. He spent a considerable part of his last stay in England in planning new arrangements for carrying out the objects of the Commission. In the latter part of his address at Cambridge he advocated the organisation of the British contribution to this side of meteorological work upon an imperial basis. He realised that an imperial combination would treat such questions with a breadth of view that is

not possible or permissible in any single colony or dependency, guided, as it must be, by the narrower consideration of its immediate needs.

"His plan was to provide for organised observations from areas too wide to be within the control of any single Government; to place the material thus obtained at the service of workers in all parts of the world by publishing it while it was still of direct practical utility and to ensure its application to the service of the Empire by a special staff of trained workers.

"Anyone who reads the address cannot fail to catch something of his enthusiasm. There is a ring of the "land of hope and glory" about his appeal for the extension of our knowledge of the facts. "Wider still and wider be thy boundaries set" bespeaks the ideal of his meteorological method, and it was to the various parts of the King's dominions that he looked for its realisation. The task was no light one. The British Association made a beginning, but imperial wheels grind very slowly. It says much for Eliot and for India that he carried with him the active support of the Indian Government for the proposal. He welcomed the idea of a meeting of British meteorologists in Canada, because it gave him the opportunity of getting a step forward, and although conscious of the personal sacrifice which it involved, he undertook to make the journey to Ottawa this year for the purpose. The intention cannot be fulfilled."

"It is a bitter disappointment to all his fellow-workers that death has brought his efforts to an untimely end. His enthusiasm was entirely free from any suggestion of selfishness or personal ambition; he could speak from an unique position with unrivalled experience. There is no one now to take his place. But the idea remains, and this country seldom wants for men when there is real work to be done. Remembering Eliot's achievements we are emboldened to fall back upon the refrain, and to add the second couplet without misgiving."

Among the more prominent of Sir John Eliot's publications are numerous accounts of cyclones and severe cyclonic storms occurring within Indian seas; also numerous meteorological discussions contributed to the Indian Meteorological Memoirs, to the Indian Cyclone Memoirs, to the Journal of the Asiatic Society of Bengal, and to the Quarterly Journal of the Royal Meteorological Society; his "Handbook of Cyclonic Storms in the Bay of Bengal" (already mentioned), and his last publication, which took the form of that most valuable work, "The Climatological Atlas of India," published by the authority of the Government of India only a few months ago; while at the time of his death he was engaged in writing a "Handbook of Indian Meteorology" to accompany this, also to be published under the direction of the Government of India.

Sir John Eliot was elected a Fellow of the Royal Society in 1895; he was created a C.I.E. in 1897, and was given his K.C.I.E. in 1903 on his retirement. In 1877 he married Mary, daughter of Mr. Wm. Nevill, of Godalming; his widow survives him, and he has left three sons.

A. P.

#### NOTES.

SIR OLIVER LODGE was unable to deliver his presidential address to the Faraday Society on Tuesday on account of an attack of influenza, from which, however, he is now recovering.

WE regret to state that the Duke of Devonshire died at Cannes on Tuesday morning, at seventy-four years of age. The Duke was a Fellow of the Royal Society and Chancellor of the University of Cambridge.

THE Right Hon. A. J. Balfour, F.R.S., has been elected a corresponding member of the French Academy of Moral and Political Sciences in succession to Lord Reay, who has been elected an associate.

THE Paris Academy of Sciences has accepted a legacy of 400*l.* from M. Sabatier to found a biennial prize to be known as the Sabatier prize.

ON the drill ground at Issy-les-Moulineaux on Friday, March 20, Mr. H. Farman traversed the complete circle two and a half times with his *aéroplane*, the length of the flight being 2750 yards, and the time 2*m.* 15*s.*

WITH regard to the inquiry of a correspondent (NATURE, March 5, p. 417) for particulars concerning the mist and Sicilian earthquake of 1783, Mr. E. A. Martin, The Museum, Croydon, writes to point out that Gilbert White has a reference thereto in his Letter 65 to Barrington ("Natural History of Selborne").

DR. HALL-EDWARDS, who recently had his left hand amputated in consequence of X-ray dermatitis, has been granted a Civil List pension of 120*l.* a year. When Dr. Hall-Edwards has recovered from the effects of the amputation, another operation will be necessary, and at least four fingers of his right hand will have to be amputated.

ON Thursday next, April 2, Mr. R. Lydekker will begin a course of two lectures at the Royal Institution on (1) "The Animals of Africa," (2) "The Animals of South America." The Friday evening discourse on April 3 will be delivered by the Right Hon. Lord Montagu of Beaulieu on "The Modern Motor-car," and on April 10 by Prof. J. J. Thomson on "The Carriers of Positive Electricity."

THE death is announced, in his seventieth year, of Dr. D. B. St. John Roosa, president of the New York Medical Post-graduate School, and professor of diseases of the eye in that institution. He formerly held chairs in the University of the City of New York and the University of Vermont. He was the author of a pocket medical lexicon and of various treatises on the eye and the ear.

PROF. W. A. KELLERMAN, who has held the professorship of botany at the Ohio State University since 1891, has died of malaria in Guatemala, which country he was visiting in order to study its flora. He was born in 1850, graduated at Cornell in 1874, and had taught botany at the Wisconsin State Normal School and the Kansas State Agricultural College. He was perhaps most widely known as founder and editor of the *Journal of Mycology*. Among his books were "Flora of Kansas," "Spring Flora of Ohio," and "Phyto-Theca."

REFERRING to the article on "Some London Problems" published in our issue of March 19, a correspondent directs attention to the arrangement for the construction of deep-water wharves near Gravesend, in Long Reach, about five miles above Tilbury. These wharves have been licensed by the Thames Conservancy and approved by the Board of Trade, though their construction has been delayed because of the Port Bill. This wharf will be capable, our correspondent states, of dealing with three million tons of traffic a year.

THE Royal Commission on Coast Erosion has been directed to inquire whether, in connection with reclaimed lands or otherwise, it is desirable to make an experiment in afforestation as a means of increasing employment during periods of depression in the labour market, and, if so, by

what authority and under what conditions such experiment should be conducted. The following new members have been added to the commission:—Mr. J. Galvin, Mr. E. S. Howard, C.B., Mr. H. C. Monro, C.B., Dr. W. Somerville, Mr. F. Story, and Mr. J. Ward, M.P.

THE sixty-first annual meeting of the Palæontographical Society was held on March 20 in the rooms of the Geological Society, Burlington House, Dr. Henry Woodward, F.R.S., president, in the chair. The annual report alluded to the unusually varied contents of the volume for 1907, due to an attempt to provide indexes and title-pages for several monographs which were either complete or discontinued. The council is beginning to favour the plan of publishing smaller works, and has included in the current volume a complete monograph of British Conulariæ, by Miss Ida L. Slater, with five plates drawn by the author. The council welcomed a contribution from the Carnegie Trust for the Universities of Scotland, which provided five plates of Scottish Carboniferous fishes described by Dr. Traquair. Mrs. G. B. Longstaff, Mr. H. A. Allen, Dr. F. A. Bather, and Mr. William Hill were elected new members of council. Dr. Henry Woodward, F.R.S., Dr. G. J. Hinde, F.R.S., and Dr. A. Smith Woodward, F.R.S., were re-elected president, treasurer, and secretary respectively.

NO. 3 of the 1908 issue of the Bulletin of the Imperial Academy of St. Petersburg contains an elaborate and well-illustrated account of the developmental history of the echinoderm *Echurus*, by Dr. N. Salensky.

THE third part of vol. vii. of the *Emu*—issued as a special supplement—is devoted to a list of Australian birds on the model of the one now in course of issue by the British Museum. The compiler, Mr. G. M. Mathews, who has recently come to reside in this country, announces his intention of issuing an illustrated work on the birds of Australia, to which the present "hand-list" is a preliminary.

RECENT issues of the Proceedings of the U.S. National Museum include papers by Mr. A. H. Clark on the crinoid genus *Comatula* (No. 1585), and on the occurrence of infrabasals in certain modern pentacrinids (No. 1582), as well as one (No. 1580) by Mr. C. B. Wilson on North American parasitic copepod crustaceans, and another (No. 1586) by Miss Richardson on isopods from the northern Pacific.

IN an article published in the *National Geographic Magazine* for February under the title of "The Policemen of the Air," Mr. H. W. Henshaw raises the question as to what would happen if birds were completely exterminated. "No one," he observes, "can foretell with absolute certainty, but it is more than likely—nay, it is almost certain—that within a limited time not only would successful agriculture become impossible, but the destruction of the greater part of vegetation would follow. It is believed that a permanent reduction in the numbers of our birds, even if no species are actually exterminated, will inevitably be followed by disastrous consequences." It is added that bird-protection in the United States requires specially stringent laws on account of the large influx of immigrants from southern Europe, to whom every bird, no matter how small, is regarded as food which ought not to be wasted.

A FURTHER contribution to the controversy with regard to the alleged existence of a British willow-titmouse (*Parus atricapillus kleinschmidti*) is made by Mr. H. B. Booth in the March number of the *Naturalist*. It has been stated

that the principal differences between willow-titmice and marsh-titmice are that the feathers on the crown and forehead are longer and more loosely constructed in the former than in the latter. The edges of these feathers are also glossy black in the marsh-titmice, thus causing the crown to be glossy and of a deeper blackness than that of the willow-titmice, which is brownish or sooty black. In the latter, again, the tail is distinctly graduated, instead of being almost squared. To these differences Mr. Booth adds the darker rufous colour of the flanks and underparts of the willow-titmice.

THE evolution of the elephant forms the subject of an interesting article by Mr. R. S. Lull, in the March number of the *American Naturalist*. Starting with the fact that they made their first appearance in the Fayum district of Egypt during the Eocene, the author considers it probable that the proboscideans remained in Africa during the Oligocene, although we have no direct evidence to that effect. Be this as it may, the four-tusked mastodon (*Tetrabelodon angustidens*) made its appearance in the early Miocene of Mogara and Tunisia, whence it migrated by means of a land-bridge connecting Tunisia and Sicily with Italy, and thence by way of Greece, into Asia. Having reached that continent, it apparently gave rise to the Indian *Mastodon cautleyi* and *M. latidens*, from which in turn sprang the primitive, or stegodont, elephants, and from these again elephants of the modern type. Later on the typical elephants themselves migrated westwards to Europe, and thence to Africa, while in the other direction they travelled by way of Bering Strait to America. Hence we are led to conclude, as has been previously pointed out by Mr. Lydekker, that while the Proboscidea originated in Africa, the modern African elephant is of Asiatic parentage, and was an immigrant into the land of its forefathers in company with the ancestors of the giraffes, okapis, and antelopes which now dominate Ethiopia. It is added that, next to man, elephants have been the greatest travellers of all mammals, having reached practically all parts of the world.

UNDER the heading of "Investigations on the Development of Trypanosomes in Tsetse-flies and other Diptera," Prof. E. A. Minchin gives in the March number of the *Quarterly Journal of Microscopical Science* the results of his investigations during a sojourn in Uganda as a member of the commission on sleeping sickness. In the author's opinion, it may now be admitted that trypanosomes undergo development (as distinct from multiplication) in invertebrate hosts, more especially tsetse-flies. It is, however, remarkable that, whereas *Trypanosoma brucei* undergoes a complete cycle of development in at least one kind of tsetse, this is not the case with *T. gambiense*. The explanation suggested is that *Glossina palpalis*, the only kind of tsetse found at Entebbe, is not the proper host of *T. gambiense*, a suggestion supported by the fact that sleeping sickness is a disease of comparatively recent introduction into Uganda. That the Gambian trypanosome has a proper host of its own cannot be doubted, and it is probable this may be a native of the Congo, where it is suggested further investigations on sleeping sickness might advantageously be conducted. In Uganda *T. gambiense* merely commences its developmental cycle in *G. palpalis*, by which, in that district, it is transmitted to the human subject in a purely mechanical and direct manner.

WE have received from Messrs. Zeiss a pamphlet descriptive of Siedentopf's paraboloid condenser, with which an exceedingly well corrected dark ground illumination

may be obtained for microscopical work. For observation, medium and high-power dry objectives should be employed. The apparatus is particularly adapted for the observation of such minute objects as bacteria and their flagella, spirochaetes, &c., in the fresh and living state, and for photographing the same under these conditions. We have also received Messrs. Zeiss's general catalogue of apparatus for ultramicroscopy, which contains much matter of interest.

IN the *Journal of Hygiene* for January (vol. viii., No. 1) Miss Harriette Chick contributes an interesting article on the theory of disinfection. She shows that a very complete analogy exists between a chemical reaction and the process of disinfection, one reagent being represented by the disinfectant, and the second by the protoplasm of the bacterium. In the case of anthrax spores, the course of disinfection apparently proceeds in accordance with the well-known equation for a unimolecular reaction, if numbers expressing "concentration of reacting substance" are replaced by "numbers of surviving bacteria." A non-sporing organism, *B. paratyphosus*, shows a departure from the simple law owing to permanent differences in resistance to disinfectants among the individual organisms, the younger bacteria proving to be the more resistant. The process of disinfection is influenced by temperature in an orderly manner, and the well-known equation of Arrhenius can be applied. Some evidence was obtained that, in disinfection with mercuric chloride, a toxic compound is formed between the metal and the substance of the bacterial cell.

THE principal article in the *Bulletin du Jardin Impérial Botanique* of St. Petersburg (vol. vii., parts v.-vi.) is an account of the soil and vegetation of the district of Jaila, in the Crimea, communicated by Mr. A. Krischtowitsch.

TAMARIND seeds are to be reckoned among the fairly nutritious plant products that have been reported to provide food during periods of famine in India. The pulp of the fruit is an esteemed ingredient of certain condiments. The kernels of the seeds when freed from the skin and roasted furnish a not unwholesome flour suitable for mixing with cereals to make small cakes. Further details and analyses are given in the *Agricultural Ledger* (No. 2, 1907) prepared by Mr. D. Hooper and published by the Government of India.

THE annual publication "One and All Gardening" has reached its thirteenth issue. Among the numerous articles, Mr. H. J. Wright furnishes an account of garden teaching in schools, in which he provides a working plan for laying out a school garden, and summarises the progress made in different counties. Mr. S. L. Bastin contributes a note on the method of retarding flowers. The editor takes for his subject the formation of garden associations to stimulate horticulture in country and town; in this connection Mr. F. H. Stead records a remarkable development of gardens in the borough of Walworth, where last year more than one hundred gardens were entered for competition at the local flower show.

THE fauna and flora of the Snares and Auckland Islands form the subject of an ecological descriptive sketch contributed by Dr. L. Cockayne to the *New Zealand Times* (December 11, 1907). The author refers to the evidence furnished by the animal and plant life on the Snares in favour of the view that when a land area is curtailed the exceptional species most frequently survive in the struggle for existence, and so reduced areas generally contain numerous endemic species. The meadows of the

Auckland Isles furnish numerous choice plants, notably the species of the composite genus *Pleurophyllum*, *Myosotis capitata*, a *Celmisia*, and gentians. Characteristic plant associations on the islands are the tussock-grasses, *Poa scoparia*, *Poa foliosa*, and *Danthonia bromoides*, confined to special localities determined chiefly by wind conditions.

THE preservation of plants so as to maintain their green colour has been attempted in several ways. Prof. Trail some years ago recommended the use of a solution of acetate of copper in acetic acid, whereby compounds of chlorophyll with copper are formed. He contributes a note to the *Kew Bulletin* (No. 2) to point out the advantage of using a boiling solution. In the same number an article on Jequié manicoba refers to the occurrence in north-east Brazil of rubber trees allied to *Manihot Glaziovii*, the source of Ceara rubber. According to German botanists, three other species, *dichotoma*, *heptaphylla*, and *piauhyensis*, should be distinguished; they are named after the regions in which they grow as Jequié, S. Francisco, and Piauhy manicobas; all are considered to be more valuable than *Manihot Glaziovii*. Determinations of new plants are published as "Diagnoses Africanæ, XXI," and "New Orchids, XXXI." The identification and occurrence of different patchouli plants form the subject of another article, and Mr. A. D. Cotton discusses the appearance in Great Britain of the alga *Colpomenia sinuosa*, indigenous in the Mediterranean.

THE report of the Chief Inspector of Mines of Mysore for the year 1905-6 (Madras, 1908) is devoted chiefly to official data on the progress of the Kolar gold mines. A decline in production is noticeable, due mainly to the decline in grade of the ore milled. There was also noticeable an increased death-rate from accidents in 1905, due mainly to a serious underground fire at the Nundydroog mine. The total value of gold bullion produced from the commencement of mining operations in Mysore up to the end of 1905 was 23,384,532l.

THE Geological Survey of Great Britain issued two additional west-country memoirs at the close of 1907. Mr. Clement Reid's "Geology of the Country around Mevagissey" (price 2s.) illustrates Sheet 353, which includes also the gneissic islet of the Eddystone from Sheet 354. This relic is probably part of an Archæan mass running east-north-east, which has governed the trend of the earth-folds in the Mevagissey district. The memoir points out how the Silurian rocks, coloured as "Grauwacke" in the old map of 1839, have now been delineated in some detail; but volunteers are asked for who will elucidate the difficulties still remaining. Beautiful examples of shear-structure in banded slates are given in the photographic plates. The second memoir is by Mr. Ussher, in explanation of Sheet 348, on "The Geology of the Country around Plymouth and Liskeard" (price 3s.), and forms a very notable contribution to our knowledge of British Devonian strata. Dr. Flett describes the numerous volcanic and intrusive rocks occurring here on various horizons. An unconformity is suggested between the Lower and Middle Culm-measures, to account for the occurrence of both series directly on Upper Devonian beds in the northern portion of the map. Mr. Ussher believes that the submerged valleys cut in the rock on the south coast owe most of their depth to river-erosion during the epoch of elevation that gave us the raised beach of the district. When this beach, therefore, was being formed at sea-level, these valleys ended in merely shallow tidal inlets. This conclusion is, as Mr. Ussher points out, in opposition to views put forward for similar phenomena in

the south of Ireland. Mr. D. A. Macalister contributes a report on the mines and minerals of the district. The colour-printed maps accompanying the memoirs above mentioned are published at 1s. 6d. each, and include, as usual, clear longitudinal sections of the country in the margins.

ACCORDING to a report in the Proceedings of the Philadelphia Academy for December, 1907, the glaciers of Alberta and British Columbia are passing through a period of shrinkage, which attained special development during the year under review. The Asulkan glacier, for example, which for several years was stationary or slightly advancing, showed a marked decrease during the past season. "Preceded by a cold and stormy winter and a summer with low average of sunshine and low temperature, these conditions point to an interesting series of changes which may ultimately throw some light on the relation between weather conditions and glacier change."

THE Scottish Oceanographic Laboratory at Edinburgh has recently issued, in the shape of a small pamphlet, an account by Dr. J. Hjort, of Bergen, of some of the results of modern international oceanic research. The account, which is translated from the Norwegian, deals firstly with the new methods of current-measurement, and then with the life-history and development of several of the commoner food-fishes, such as haddock, herring, saith, cod, and plaice. Diagrammatic illustrations are given of the form and size of the scales of these fishes at different periods of existence, and the means of thereby ascertaining the approximate age of any individual fish. The ages of the plaice are illustrated, on the other hand, by diagrammatic sketches to scale of four specimens at as many stages of existence. The pamphlet should be of considerable value to all who are connected with our fisheries.

A DETAILED account by Mr. A. Schmauss of twenty-one unmanned balloon ascents made in 1907 at Munich is published in an excerpt paper from the regular meteorological year-book of Bavaria. The experiments, which were made with great care, show that in the lower air strata the temperature gradient is subject to great oscillations, and that the greatest decrease of temperature with height is found between 5 and 8 kilometres. Between 8 and 11 kilometres there is a transitional zone leading to the upper isothermal layer or inversion. After this stratum of increasing temperature follows another slowly augmenting decrease of temperature from about 14 kilometres upwards. Between 1 and 5 kilometres the same rate of decrease of temperature that exists at mountain stations was found to hold good.

In the *U.S. Monthly Weather Review* for October, 1907, Mr. H. H. Clayton (by permission of Prof. A. L. Rotch) discusses the lagging of temperature changes at great heights behind those at the earth's surface, and types of pressure changes at different levels, as shown by the records of sounding balloons liberated at St. Louis in April and May, 1906. The observations show that at all heights above about 1 kilometre the temperature changes occur later with increasing elevation; at 10 kilometres the maxima and minima are generally about twenty-four hours later than on the ground. Only a few observations at 15 kilometres were available, but they appear to show that the irregular ranges of temperature at that height are much less than at sea-level. Referring to the maxima and minima of pressure, it is found that at 10 kilometres the curve is almost the reverse of that at sea-level; at 15 kilometres it is somewhat similar to that at 10 kilometres, but the ranges are much reduced.

Among other useful articles we may mention Mr. W. A. Bentley's interesting studies of frost and ice crystals, and a mathematical investigation by Prof. F. H. Bigelow on vortices in the atmosphere.

TIDAL bores in China and Japan form the subject of two recent papers differing widely in character. In the *Popular Science Monthly* for March Dr. Charles Keyser Edmunds gives an illustrated account of his visit to the Hangchow bore, while a bore in Odawara which sometimes does much destruction is treated from the hydrodynamical point of view by Prof. H. Nagaoka in a short note in the Proceedings of the Tokyo Mathematico-Physical Society for November last.

THE Bulletin of the American Mathematical Society for March contains an account of a joint meeting held at Chicago in December last between mathematicians and engineers for the discussion of the teaching of mathematics to engineering students. The discussion in question refers mainly to the mathematical requirements of the average engineer who is occupied exclusively in practical applications of known methods. Little or nothing is said by the speakers about the growing need of original workers, who, by bringing the highest mathematical knowledge to bear on engineering problems, are able to devise new methods, and to guide the ordinary practical experimenter.

A SUGGESTION for a new economic arithmetic is the subject of a short paper in the *Economic Journal* for March by Prof. T. N. Carver. The author's ideas are simple and practical, and at the same time scientific. He considers that the teaching of arithmetic can be illustrated with advantage by simple problems based on tables, of which he gives as an example one showing the quantity of corn grown with varying quantities of labour on a given quantity of land. The problems that can be worked out as exercises with such a table include the following:—Given the cost of labour and the value of the corn, how many days' labour can be most profitably devoted to the cultivation of the fields? Or, again, given the number of available days' labour, how many acres can be most profitably cultivated? It is pointed out that complicated mathematical methods or the plotting of curves are unnecessary for the solution of such simple problems, and the author quotes the existing methods of dealing with tariff reform controversy as an instance of the want of such simple training. In support of the author's view, it must be admitted that there is a great deal commonly taught under "arithmetic" which might well be superseded by such studies as he suggests. But where are the statistics necessary for such a course to be obtained?

THE *National Geographic Magazine* (xix., 1) contains an illustrated account of Dr. Alexander Graham Bell's experiments with his *Cygnets* man-lifting kite. This kite was sent up in December, 1907, both with and without a man, Lieut. Selfridge having ascended 168 feet with it, and having remained in the air for more than seven minutes. The kite is described as "tetrahedral" in shape—perhaps it would be better to describe it as a triangular prism with oblique ends. It measures 13 metres laterally at the top and 10 metres at the bottom, 3 metres longitudinally at the bottom, and 3 metres in oblique height. It consists of 3393 winged cells having a surface of 183.6 square metres. It weighs 85 kilograms, and is provided with floats, weighing 9.4 kilograms, which enable it to rest on the surface of a sheet of water. In the experiments performed at Baldeck, Nova Scotia, the kite flew with remarkable steadiness, and Dr. Bell considers

this fact a justification for extending the experiments to motor-driven machines constructed on a similar principle.

AN interesting lecture was given by Sir William Preece at the Institution of Electrical Engineers on March 12 on his recent visit to America, and the various improvements in constructional and engineering work since his previous visits were dealt with. The sky-scraper buildings appear to afford a considerable day load in that they employ numerous lifts which are constantly in use, but the public supply does not benefit from these very much, as in the larger buildings the tendency is to erect private plants. On the telephone question, America seems to have gone ahead of us on this side. In most of the hotels telephones are installed in every bedroom, so that business may be transacted with any part of the country. This applies also to the restaurants, where telephones may be plugged on to your table if desired. The Telephone Tariff question has also been thoroughly considered in America, and the message rate has been adopted in preference to the simple annual rental.

In the Proceedings of the American Academy of Arts and Sciences (vol. xliii., No. 12) Messrs. Gregory P. Baxter and John H. Wilson describe a number of re-determinations of the atomic weight of lead, the true value of which is at present uncertain owing to the wide discrepancies in the results of previous workers. The method of analysis adopted consisted in determining the proportion of chlorine in lead chloride by precipitation with silver nitrate; this method seemed the best to use in view of the fact that the halogen can be determined with great accuracy, and the elimination of moisture from lead chloride is easily effected by fusion of the salt in a current of hydrogen chloride. Silver chloride, moreover, when precipitated from a dilute solution of lead chloride, does not contain an amount of occluded lead salt large enough to be detected. Special care was taken, of course, in the purification of the materials employed. The results obtained were very concordant, varying in one series, in which the ratio  $\text{PbCl}_2 : 2\text{Ag}$  was determined, from 207.173 to 207.202, with an average of 207.188; in another series, based on the ratio  $\text{PbCl}_2 : 2\text{AgCl}$ , the average 207.191 was obtained, with a range of variation from 207.181 to 207.204. The mean result,  $\text{Pb} = 207.19$  ( $\text{O} = 16$ ,  $\text{Ag} = 107.93$ ), is nearly three-tenths of a unit higher than the value for the atomic weight of lead now in use.

A SECOND edition of Mr. J. W. Hayward's "First Stage Steam" has been published by Mr. W. B. Clive.

THE spring list of the Oxford University Press includes "Floral Mechanism" (part i., types 1 to 12), by Dr. A. H. Church, and "Lectures on Evolution," by Prof. E. B. Poulton, F.R.S.

MESSRS. A. GALLINKAMP AND CO., LTD., have issued a catalogue of the Meker hot-flame burners, Dennstedt's combustion furnaces, accessories for use with the furnaces, and cylinders of compressed air, which they are now prepared to supply.

A NINTH edition of Mr. W. T. Lynn's "Remarkable Eclipses" has been issued by Messrs. S. Bagster and Sons, Ltd. The booklet has been brought up to date, and provides a sketch of interesting facts connected with solar and lunar eclipses.

MESSRS. A. AND C. BLACK will publish shortly a book on "Kafir Socialism," by Mr. Dudley Kidd; a book on botany for young children, by Mr. O. V. Darbishire, of Manchester University; and a re-issue, at a popular price, of

the fourth edition of the late Miss Agnes M. Clerke's "History of Astronomy in the Nineteenth Century."

THE Bibliographischen Institut of Leipzig and Vienna has sent us the first part of a second revised and enlarged edition of Dr. M. W. Meyer's popular work on general astronomy entitled "Das Weltgebäude." The edition will be completed in fourteen parts, to be published at the price of one mark each.

It is announced that papers on parasitology, which have hitherto appeared in the *Journal of Hygiene*, will in the future be published in a separate volume to be entitled *Parasitology, a Supplement to the Journal of Hygiene*. The publication will be edited by Prof. Nuttall and Mr. Shipley.

A THIRD edition of Mr. Douglas English's "Wee Tim'rous Beasties" has been published by Messrs. Cassell and Co., Ltd. These studies of animal life and character were reviewed in the issue of *NATURE* for December 24, 1903 (vol. lxi., p. 176), on which occasion we reproduced one of the excellent illustrations with which the volume is plentifully supplied.

WE have received a copy of an interesting and fairly complete international catalogue of the more important periodical publications of the world, which has been compiled by Prof. Emile Guarini, and published in Paris by MM. H. Dunod and E. Pinat. The price is 3 francs, and the catalogue gives the address, publisher, and price of 4063 reviews and journals classified according to countries.

MESSRS. PAWSON AND BRAILSFORD, of Sheffield, have published a third edition of Mr. J. Simpson's "The Wild Rabbit in a New Aspect, or Rabbit Warrens combined with Poultry Farming and Fruit Culture." The book has been revised and enlarged, contains several illustrations, and will probably assist the encouragement of rabbit warrens and rabbit farming, whether conducted for sport or profit.

ANOTHER volume has been added to the series dealing with the fauna of British India, including Ceylon and Burma, edited by Lieut.-Colonel C. T. Bingham, and published under the authority of the Secretary of State for India by Messrs. Taylor and Francis. The new volume continues the consideration of the Coleoptera, and is concerned with a portion of the family Chrysomelidae. It is the work of the late Mr. Martin Jacoby. In a short preface the editor expresses the hope that the book will direct the attention of collectors in India to this somewhat neglected but important group of phytophagous beetles, and prove of assistance to them in their study.

#### OUR ASTRONOMICAL COLUMN.

WATER VAPOUR IN THE MARTIAN ATMOSPHERE.—A glance at a print from a series of spectrograms taken by Mr. Slipher on January 15, which Prof. Lowell has kindly sent to Sir Norman Lockyer, leaves but little doubt that water vapour is present in the atmosphere of Mars. This print includes two spectra of the moon and one of Mars, and whilst the *a* band is absent from the former, it is quite a marked feature of the latter spectrum. The exposure for the spectrum of Mars was from 5h. 35m. to 8h. 30m., the mean altitude of the planet being 43°, whilst those for the moon were made at 15h. 26m., the altitude being 30°; the aqueous vapour per cubic foot of air, during the exposures, was found to be 1.25 grains.

THE DISPERSION OF LIGHT IN INTERSTELLAR SPACE.—In No. 6 (February 10, p. 266) of the *Comptes rendus* Dr. C. Nordmann described a method whereby the dispersion of light in interstellar space might possibly be determined. Briefly, the method consists in making photometric observa-

tions of quickly changing variable stars, the light of the star being first passed through different coloured screens for each observation. If all radiations traverse space with equal velocities, such observations should give light-curves agreeing in phase among themselves and with those determined in the ordinary method; but if some radiations are relatively retarded, then the light-curves so determined should exhibit marked deviations of phase. Three liquid screens transmitting only radiations of  $\lambda\lambda=5900$  to the extreme red, 5900 to 4900 and 4900 to the ultra-violet, respectively, were prepared, and Dr. Nordmann's preliminary results are published in No. 8 (February 24, p. 383) of the *Comptes rendus*.

Algol and  $\lambda$  Tauri were the stars examined, and in both cases it was found that, whilst the light-curves obtained when the several screens were successively employed agree in amplitude and form with the ordinary light-curves, there is a measurable difference in the epoch of any specific phase. With Algol the difference in time for the red and blue screens amounted to sixteen minutes, whilst for the red and green screens the difference was nine minutes; these preliminary values are probably correct to within about three minutes. The difference between red and blue for  $\lambda$  Tauri was about forty to sixty minutes, i.e. approximately three times the analogous difference in the case of Algol; that is to say, the parallax of  $\lambda$  Tauri is, presumably, about one-third that of Algol. Combining these results with Pritchard's value for the parallax of Algol, 0".0556, it follows, assuming space to be homogeneous, that the difference between the velocities of the extreme ends of the visible spectrum amounts to something of the order of 150m. per second.

Dr. Nordmann points out that this method of investigation offers great possibilities in several lines of research, among which the determination of the parallaxes of variable stars and the gauging of space for dark absorbing material would not be the least interesting from a cosmological point of view.

THE MOVING OBJECT NEAR JUPITER.—Some revised Greenwich positions for the suspected new Jovian satellite are given in No. 4239 of the *Astronomische Nachrichten* (p. 235). This object was observed by Prof. Albrecht at the Lick Observatory on March 8, and its visual magnitude was recorded by Prof. Aitken as 15.0.

DISTRIBUTION OF STANDARD TIME IN EGYPT.—The February number of the Cairo Scientific Journal (vol. ii., No. 17, p. 50) contains a very interesting account, by Captain H. G. Lyons, of the methods of determining and distributing standard civil time in Egypt. The standard now used is the East Europe Time of the thirtieth meridian E. of Greenwich, and Captain Lyons's history of the long sequence of events which led to its adoption is of great interest. The organisation for the distribution appears now to be efficient, and is described and illustrated in the article under notice.

OBSERVATIONS OF ALGOL VARIABLES.—The results of a systematic investigation of the light-changes of ten Algol variables are published by Dr. K. Graff in No. 11 of the *Mitteilungen der Hamburger Sternwarte*. The observations were made during the years 1905, 1906, and 1907, and Dr. Graff, in addition to giving the observational and derived values and the method of reduction, gives charts of the regions surrounding the variables, and a light-curve for each. The stars observed were W Delphini, SW, SY, UW, VW, and WW Cygni, U Sagittæ, Z Persei, Z Draconis, and RW Tauri.

NEBULÆ AND NEBULOSITIES OBSERVED BY PROF. BARNARD.—The purity of the atmosphere at the Mount Wilson Observatory is once more emphasised by some results described by Prof. Barnard in No. 4239 of the *Astronomische Nachrichten* (p. 231, March 17). Nebulosity suspected on earlier photographs are shown unmistakably on those taken during Prof. Barnard's sojourn at Mount Wilson; considerable extensions are shown on others. Messier 8, 16, 17, and 20 are amongst those now described, and in the case of the last-named, the Trifid nebula, extensions appear which have not been seen before by Prof. Barnard; the greatest diameter is 36' long, in a S.E. and N.W. direction, and the numerous black lanes, which have made this nebula celebrated, are beautifully shown.